**Re-examining Formulas**

**Purpose**

Throughout your years of schooling, you have encountered and learned to use many different formulas. You have certainly used formulas in your mathematics and science classes, and you may have used them in your social studies classes also. Many of those formulas described direct or inverse variation relationships between variables. Others may have indicated some combinations of direct and inverse variation between the variables. In this project, you will gather formulas you have previously used and examine them in terms of what you learned about variation in this unit.

**Directions**

**1.** Think about times when you have used formulas either in school or outside of school. Make a list of at least 15 different formulas that you have used. With each formula, describe what the formula is used for and what the variables represent.

**2.** Now think about what you learned about variation in this unit and separate your formulas into four groups: direct variation (including power models), inverse variation (including power models), combined variation (both direct and inverse variation, multiple direct variations, or multiple inverse variations), or neither direct nor inverse variation. If you do not have at least one formula in each of these groups, find more formulas so that you have at least one in each group. As you separate your formulas, make notes about what criteria you are using to make your decisions.

**3.** For each of your formulas that is an example of direct or inverse variation or a combination of direct and inverse variation, write a sentence that describes the relationship in the language of direct and inverse variation or proportionality. In each case, be sure to identify the constant of proportionality. (For example, “The variable \_\_\_\_\_ is \_\_\_\_\_ proportional to \_\_\_\_\_, with constant of proportionality \_\_\_\_\_.”)

**4.** Organize the work that you completed in Parts 1-3of this project so that you clearly convey your understanding of variation and how it applies to the formulas that you used for the project. Your report can be a typed paper, PowerPoint (or Google Slides), or a poster board. You may present your report to the class, additionally, if you so desire. Your project should include one section for each group in Part 2. Be sure that it includes all of the work you did and complete explanations of how you made the decisions about the categories for formulas. Your explanations about how you made your decisions should be complete enough so that if your principal thought of a formula, he or she could use your explanation to properly put the formula into the correct group.